Journal of Volcanology and Geothermal Research, Volume 100 Nos. 1–4

Special Issue

MERAPI VOLCANO

edited by

B. VOIGHT

Department of Geosciences, The Pennsylvania State University, University Park, PA 16802, USA

R. SUKHYAR

Directorate General of Geology and Mineral Resources, Jn Prof Dr Soepomo SH no. 10, Jakarta Selatan, Indonesia

A.D. WIRAKUSUMAH

Volcanological Survey of Indonesia, Jn Diponegoro, Bandung, Indonesia

CONTENTS

A preface from the Governor of Yogyakarta Special Province SULTAN HAMENGKU BUWONO X on the occasion of the publication of the special issue on Merapi Volcano vii

Foreword
A.D. Wirakusumah ix

Foreword
J.-C. Sabroux xi

Foreword
T.J. Casadevall xiii

Introduction to the special issue on Merapi Volcano
B. Voight, R. Sukhyar and A.D. Wirakusumah 1

10,000 Years of explosive eruptions of Merapi Volcano, Central Java: archaeological and modern implications
C.G. Newhall, S. Bronto, B. Alloway, N.G. Banks, I. Bahar, M.A. del Marmol, R.D. Hadisantono, R.T. Holcomb, J. McGeehin, J.N. Miksic, M. Rubin, S.D. Sayudi, R. Sukhyar, S. Andreastuti, R.I. Tilling, R. Torley, D. Trimble and A.D. Wirakusumah 9

A detailed tephrostratigraphic framework at Merapi Volcano, Central Java, Indonesia: implications for eruption predictions and hazard assessment
S.D. Andreastuti, B.V. Alloway and I.E.M. Smith. 51

Historical eruptions of Merapi Volcano, Central Java, Indonesia, 1768–1998
B. Voight, E.K. Constantine, S. Siswowidjoyo and R. Torley 69

Merapi (Central Java, Indonesia): An outline of the structural and magmatological evolution, with a special emphasis to the major pyroclastic events
G. Camus, A. Gourgaud, P.-C. Mossand-Berthommier and P.-M. Vincent 139

Magmatic processes revealed by textural and compositional trends in Merapi dome lavas
J.E. Hammer, K.V. Cashman and B. Voight 165

An overview of the seismicity of Merapi volcano (Java, Indonesia), 1983–1994
A. Ratdomopurbo and G. Poupinet 193

Broadband seismic experiment at Merapi Volcano, Java, Indonesia: very-long-period pulses embedded in multiphase earthquakes
D. Hidayat, B. Voight, C. Langston, A. Ratdomopurbo and C. Ebeling 215
Ground deformation at Merapi Volcano, Java, Indonesia: distance changes, June 1988–October 1995
K.D. Young, B. Voight, Subandriyo, Sajiman, Miswanto and T.J. Casadevall 233
Deformation and seismic precursors to dome-collapse and fountain-collapse nuées ardentes at Merapi Volcano, Java, Indonesia, 1994–1998
B. Voight, K.D. Young, D. Hidayat, Subandrio, M.A. Purbawinata, A. Ratdomopurbo, Suharna, Panut, D.S. Sayudi, R. LaHusen, J. Marso, T.L. Murray, M. Dejean, M. Iguchi and K. Ishihara 261
Temporal gravity at Merapi during the 1993–1995 crisis: an insight into the dynamical behaviour of volcanoes
P. Jousset, S. Dwipa, F. Beauducel, T. Duquesnoy and M. Diament 289
Magnetic monitoring at Merapi volcano, Indonesia
J. Zlotnicki, M. Bof, L. Perdereau, P. Yvetot, W. Tjetjep, R. Sukhyar, M.A. Purbawinata and Suharno 321
Internal structure of the Merapi summit from self-potential measurements
M. Aubert, I.N. Dana I and A. Gourgaud. 337
Nuées ardentes of 22 November 1994 at Merapi volcano, Java, Indonesia
E.K. Abdurachman, J.-L. Bourdier and B. Voight 345
Sequential dome-collapse nuées ardentes analyzed from broadband seismic data, Merapi Volcano, Indonesia
A. Brodscholl, S.B. Kirbani and B. Voight 363
Emplacement temperatures of the November 22, 1994 nuée ardente deposits, Merapi Volcano, Java
B. Voight and M.J. Davis 371
A statistical study of trees damaged by the 22 November 1994 eruption of Merapi volcano (Java, Indonesia): relationships between ash-cloud surges and block-and-ash flows
K. Kelfoun, F. Legros and A. Gourgaud 379
Pyroclastic current dynamic pressure from aerodynamics of tree or pole blow-down
A.B. Clarke and B. Voight 395
Three fragmentation mechanisms for highly viscous magma under rapid decompression
M. Alidibirov and D.B. Dingwell 413
Lahars at Merapi volcano, Central Java: an overview
F. Lavigne, J.C. Thouret, B. Voight, H. Suwa and A. Sumaryono 423
Instrumental lahar monitoring at Merapi Volcano, Central Java, Indonesia
F. Lavigne, J.-C. Thouret, B. Voight, K. Young, R. LaHusen, J. Marso, H. Suwa, A. Sumaryono, D.S. Sayudi and M. Dejean 457
Toward a revised hazard assessment at Merapi volcano, Central Java
J.-C. Thouret, F. Lavigne, K. Kelfoun and S. Bronto 479
Hazard estimation of the possible pyroclastic flow disasters using numerical simulation related to the 1994 activity at Merapi Volcano
H. Itoh, J. Takahama, M. Takahashi and K. Miyamoto 503